

ABSTRACT

A tapered profile magnetic field pulsed laser deposition (PLD) system and method for depositing a thin film on a substrate are provided. The system includes a tapered pulsed coil arranged relative to a confinement magnetic device so that the plume discharged from the confinement magnetic device is collected and concentrated by an inwardly tapered surface of the tapered pulsed coil which causes the plume to be deflected towards a substrate on which the charged species are deposited to form the thin film. In yet a further aspect, a device for maintaining cleanliness of an interior of a deposition chamber laser entry window through which a laser beam enters and converges to a target is provided. A plume that is generated when a laser beam ablates the target is ionized as a result of radioactive members such that the ionized plume is deflected toward one of the first members (e.g., metal plates) as opposed to coating the interior of the laser entry window.